

## **THE USE OF ANTIBIOTICS IN THE NEW ZEALAND POULTRY INDUSTRY**

### **FREQUENTLY ASKED QUESTIONS 20 DECEMBER**

#### **Antibiotics**

##### **Background**

Since the introduction of the first antibiotic penicillin, almost 50 years ago, antibiotics have made an important contribution to medicine by substantially reducing the number of people and animals that suffer or die from infectious bacterial diseases.

Antibiotics kill or inhibit bacteria and closely related organisms but they have no effect on viral and fungal infections.

When needed antibiotics are administered to large flocks of animals through feed or water under the professional guidance of a Veterinarian. Label directions define usage, species, dosage, duration and withdrawal periods prior to slaughter.

In summary, antibiotics are used:

- In human medicine;
- In animals commercially farmed for food production;
- For the treatment of disease in companion animals, i.e. dogs and cats.

The Agricultural Compounds and Veterinary Medicines (ACVM) Group of the New Zealand Food Safety Authority (NZFSA) registers the antibiotics used in the New Zealand Poultry Industry.

Antibiotics are used to maintain the health of groups of animals that are often exposed to micro-organisms and where there is a risk that these can rapidly multiply and cause disease.

The New Zealand Veterinary Council registers all veterinarians who work in the New Zealand Poultry Industry. These industry veterinarians endorse and work with the Guidelines for the Prudent Use of Antibiotics.

Finally, New Zealand leads the world in taking action on this issue. In a country so dependent upon our reputation as a producer of safe food, protecting both our animal welfare/health and human health.

##### **Guidelines for the Prudent Use of Antibiotics**

Minimise the need to use antibiotics in food animals

When antibiotics are used, use them properly

Minimise the consequences of antibiotic use with respect to human health and continued efficacy

## Basic Principles of Antibiotic Use

- Antibiotics are health management tools to enhance good husbandry practices. Codes of good practices, quality assurance programs, surveillance programs and education programs should promote responsible use
- Antibiotics should only be used under the supervision of a veterinarian
- Therapeutic antibiotics should only be used when it is known or suspected that an infectious bacterial pathogen is present
- Bacterial culturing and sensitivity testing should be utilized
- Label instructions should be carefully followed
- Antibiotics used for therapy should be used only as long as needed, over as short a dosage period as possible, and at the appropriate dosage regimen
- Records should be kept of all antibiotic administrations
- Co-ordinated bacterial resistance surveillance should be conducted. Efficacious, scientifically proven alternatives to antibiotics are needed as an important part of good husbandry practices

## FREQUENTLY ASKED QUESTIONS

### What is an antibiotic?

Antibiotics are substances that kill or inhibit the growth of bacteria and related micro-organisms. With the introduction of the first antibiotic penicillin almost 50 years ago, antibiotics have made an important contribution to medicine by substantially reducing the number of people and animals that suffer or die from infectious bacterial diseases.

### How does an antibiotic work?

Antibiotics only kill or inhibit bacteria and closely related organisms. Antibiotics have no effect on viral and fungal infections. That is why the doctor doesn't generally prescribe antibiotics for a simple cold, because antibiotics have limited effect on infections of this type.

Antibiotics only control certain types of bacteria; they have a varying spectrum of activity. Some only control a few types of bacteria, whilst others have a much broader spectrum. The antibiotics used in the New Zealand Poultry Industry predominantly have a narrow spectrum of activity.

Some organisms have an intrinsic resistance to certain antibiotics, because of the structure of the organism. The cell wall structure of the bacterium for example will influence whether a specific antibiotic class will have an effect on it. While some antibiotics will kill a wide range of bacteria it is common that antibiotics designed to treat gram-negative infections will have little effect on gram-positive organisms.

Antibiotics inhibit or kill bacteria by targeting components of the bacteria that are vital for bacterial growth and metabolism.

Antibiotics can disrupt the bacterial cell wall, disrupt the ribosomal function; disrupt the DNA structure and function; or disrupt the cell membrane function.

(Expert Panel Review of Antibiotic Resistance, 31 July 1999, PG 19)

## For what reasons are antibiotics used in food producing animals?

**Disease treatment:** - used for the cure or the amelioration of a disease

Antibiotics work by reducing bacterial levels and allowing for the animals' own defence mechanisms to cure the infection.

**Disease control** ñ may follow on from treatment (as above)

To ensure the health of animals, farmers closely monitor such conditions and will add antibiotics to the feed or water of animals to contain such outbreaks.

**Disease prevention** ñ preventing the occurrence of disease in a susceptible population

**Health maintenance** ñ Shifting the population balance of the micro-flora in the gastrointestinal tract, and preventing proliferation of harmful organisms. Feed efficiency and average daily gain are indicators of healthy gut flora.

(Source: *Taber's 18th* and *Stedman's 27th* edition Medical Dictionaries)

## Why Are Antibiotics Used In The New Zealand Poultry Industry?

More than 40 years ago, government regulatory authorities first approved the use of antibiotics in animals. Since then, antibiotics have been used safely for livestock and poultry production.

The antibiotics used in the New Zealand Poultry Industry are registered for use by the New Zealand Food Safety Authority (NZFSA).

Intestinal infections can be a common disease of commercially farmed poultry. The use of in feed antibiotics reduces the incidence of these intestinal infections and ensures that optimal animal health and therefore welfare is maintained.

Because the bird is healthy they are better able to utilise food eaten for growth rather than using the nutrients to fight and recover from disease occurrences. A sick bird will also lose its appetite and thus not eat.

Antibiotics have been used safely in food animal production for more than 40 years.

Antibiotics are important health management tools allowing farmers to raise healthy animals. While the potential for resistance to develop has been identified in recent years the correct selection of and prudent use of the right antibiotic minimises the risk of resistance developing.

## What are the benefits of using antibiotics?

The use of antibiotics in the poultry industry is to ensure that the birds remain healthy.

This is one of the requirements of the Animal Welfare Act, 1999.

Sections 4 and 10 of the Act state: *Section 4 (e) - Protection from, and rapid diagnosis of, any significant injury or disease; and*

*Section 10 - Obligation in relation to physical, health and behavioural needs of animals, the owner of an animal, and every person in charge of an animal, must ensure that the physical, health and behavioural needs of the animal are met in a manner that is in accordance with both good practise; and scientific knowledge.*

**Improved health:** Antibiotics are used to treat and prevent a variety of illnesses in food animals (poultry, swine and cattle).

### **Reduced mortality rates**

### **Better nutrient utilisation:**

When used for health maintenance, antibiotics decrease the amount of feed needed and allow the bird to grow at its potential.

### **What is the therapeutic use of antibiotics?**

The administering of antibiotics for a limited period to individual or groups of animals showing signs of disease. (Expert Panel Review of Antibiotic Resistance, 31 July 1999, MAF)

### **Why are antibiotics used therapeutically?**

The therapeutic use of antibiotics is necessary to treat the clinical symptoms of the infection caused by a disease causing bacteria. Without this antibiotic treatment the animal's body may not be able to fight the disease. Therapeutic doses of antibiotics often need to be sufficiently high to produce the desired result.

### **What is the prophylactic use of antibiotics?**

The administering of antibiotics for a limited period to large or small groups of healthy animals deemed to be at risk of disease caused by pathogens susceptible to the drugs. (Expert Panel Review of Antibiotic Resistance, 31 July 1999, MAF)

### **Why are antibiotics used prophylactically?**

Antibiotics are used prophylactically to prevent the animal from becoming sick with a disease when it is suspected that they have been exposed or are likely to be exposed to a disease-causing organism. Without antibiotic intervention the animal could show clinical symptoms of disease and could require therapeutic dosages of antibiotic.

### **What is a MRL?**

A Maximum Residue Level (MRL) is the amount of residue of a substance like an antibiotic that is allowed to be present in food sold for human consumption. The residue level decreases from the last treatment until the substance is no longer detectable in the animals. Therefore residue levels are controlled by imposing a withdrawal period after the last treatment before the animal can be slaughtered for human consumption. Extensive testing on the medication occurs prior to the product being licensed and registered for use with animals. Adherence to the stated withdrawal period of a particular product will ensure the maximum residue levels are not exceeded in the animal product. There is a considerable safety margin between the maximum residue level and any risk to humans.

### **What is antibiotic resistance?**

Antibiotic resistance in bacteria may be intrinsic or acquired. Antibiotic resistance is a relative term and describes a situation where a bacterium is not inhibited or killed by concentrations of antibiotic that would normally be lethal to that bacteria.

## **Does the use of antibiotics in animals contribute to antibiotic resistance in human medicine?**

The Ministry of Health has monitored the prevalence of antibiotic resistance among important human pathogens since 1972, and there is no evidence in New Zealand to date that the use of in-feed antibiotics in animals has promoted resistance in any human pathogens. The actions taken by MAF Food recognise that there is a risk that resistance could occur. In light of this the changes made are considered prudent with the controls designed to minimise any opportunities of this happening in New Zealand. Any developments are monitored and new evidence of risk will be reflected in additional controls.

To date, there is only indirect scientific evidence linking the use of antibiotics in food animals with the potential to compromise the efficacy of related antibiotics in human medicine. In 1999, an independent foundation of renowned and respected scientists in Europe, the Heidelberg Appeal Nederland Foundation, released the most extensive scientific review of antibiotics used in intensive animal production. They found there was no evidence that these antibiotics used in animal production compromised the efficacy of related antibiotics in human medicine and no epidemiological data suggesting it increases infectious diseases.

## **What is a growth hormone?**

Growth hormones make animals grow faster by altering the metabolic processes at a cellular level in the animal. Any growth rate changes in animals that are given hormones are the direct result of the hormone. A growth hormone is a chemical messenger within an animal that stimulates or inhibits specific metabolic activities in tissues or organs. A synthetic growth hormone is a man-made chemical that is similar enough in amino acid sequence and structure to allow it to mimic the effect of the natural hormone it is copying.

## **What is the difference between antibiotics and a growth hormone?**

Antibiotics do not mimic the effect of natural hormones nor do they alter any metabolic process of the animal (like growth hormones do). They only work on bacteria, which can affect the health and welfare of the bird. Growth hormones have no antibacterial effect.

## **What would happen if Antibiotic Use Was stopped?**

Antibiotics maintain the health of groups of animals that are often exposed to micro-organisms that can rapidly multiply and cause disease. Without antibiotic intervention to prevent, treat and manage disease, the health of the animals maybe compromised and a substantial number of animal deaths could occur with some diseases. In such circumstances the welfare of the birds is compromised. In instances overseas where the practice of feeding antibiotics for growth promotion or for prevention of disease has been banned, it has resulted in an increase in disease and the therapeutic use of antibiotics for animal health and welfare reasons.

## **Is there an increased risk for those people who consume a lot of poultry?**

No, provided chicken is thoroughly cooked, it is safe to eat.

Appropriate precautions when handling raw meat include:

- washing hands after handling it,
- storing and defrosting it in a sealed container in the refrigerator to ensure juice from raw meat or thaw drip from frozen meat is not allowed to contaminate other foods,
- thoroughly cleaning any surface that raw chicken comes into contact with such as chopping boards, knives and bench tops.

The New Zealand Foodsafe Partnership makes some key recommendations the raw food handling procedures to ensure food safety.

Please see [www.foodsafe.org.nz](http://www.foodsafe.org.nz) for more information on the messages of the partnership.

## How does New Zealand compare with other countries?

New Zealand is ahead of the rest of the world in taking action on this issue. In a country so dependent upon our reputation as a producer of safe food, protecting both our animal welfare and human health must be priorities.

The NZFSA is confident that the actions taken in regard to antibiotic resistance have positioned us well to continue to safeguard this reputation.

Some products used for therapeutic medication in Europe and in the USA are specifically prohibited in food producing animals in New Zealand because of the use of these products specifically to treat some bacterial infections in humans.

## Who Is Responsible For Registration Of Antibiotics Used In The Industry?

The Agricultural Compounds & Veterinary Medicines (ACVM) Group is responsible for the registration of agricultural compounds and veterinary medicines, and monitoring their importation, manufacture, sale and use in conjunction with the Animal Remedies and Pesticides Boards.

The Agricultural Compounds and Veterinary Medicines (ACVM) Act (1997) is part of the wider reform of agricultural legislation agreed by Government in the late 1980s. It controls the agricultural compounds and veterinary medicines used in association with animals and plants, and is a companion measure to the Hazardous Substances and New Organisms (HSNO) Act 1996. The ACVM Act replaces the Animal Remedies Act 1967, the Stock Foods Act 1946, the Fertilisers Acts 1960 and 1982, and together with the HSNO Act (1996), the Pesticides Act 1979.

Under the new legislation, the Director-General of Agriculture and Forestry is the decision-maker responsible for administering the ACVM Act. The ACVM Group is focused on the following core functions so that they do not pose unacceptable risks to trade in primary produce, agricultural security or animal welfare; and result in violative residues.

The Group also ensures that products are sold with sufficient consumer information so that they can be used safely and appropriately.

The ACVM Group has established a registration decision rationale for antibiotic products based on:

- the relative importance of specific antibiotics to use in human medicine;
- the likelihood of the development of antibiotic resistance to those antibiotics;
- the potential for exposure of food animals to the antibiotics; and
- the relative importance of those antibiotics to the welfare of animals.

Applying this rationale ensures that proper conditions are imposed on antibiotic products that could cause antibiotic resistance.

The International Federation for Animal Health, the World Veterinary Association and the International Federation of Agricultural Producers have developed a set of guidelines for the use of antibiotics in food animals. These recommendations are published in a document titled 'Prudent Use of Antibiotics: Global Basic Principles'. These guidelines have been adopted by the New Zealand Veterinary Association as a code of professional conduct.

*All Veterinarians who work in the New Zealand Poultry Industry are registered under the Veterinarians Act 1994 and are subject to the Veterinary Council of New Zealand Code of Professional Conduct that specifies a veterinarians professional responsibility when prescribing products as such as antibiotics. These industry veterinarians endorse and work with the Guidelines for the Prudent Use of Antibiotics.*

## **What are government authorities doing to ensure the safe use of these products?**

The ACVM group of NZFSA reviews antibiotic products before they are granted a registration for use in food animals. To receive registration, antibiotics must satisfy stringent criteria for safety, quality and efficacy, thus ensuring food safety and animal health. The introduction by the ACVM Group of a registration decision making rationale in regard to antibiotic resistance has seen significant changes in the conditions imposed on antibiotic resistance. All antibiotics that are of significance to the antibiotic resistance problem are now prescription products that can be used only for therapeutic or prophylactic purposes. They cannot be used for growth promotion.

Extra conditions have been imposed where necessary to ensure that veterinarians prudently prescribe the use of antibiotics. Manufacturers are obliged to report annually the sales of their antibiotic products.

Monitors MRLs in the New Zealand Poultry Industry.

Government regulatory process requires audit procedures for Residue Control and the Whole Flock Health scheme as required by the Animal Products Act.

## **What research is being undertaken in NZ in regard to understanding the use of antibiotics in NZ?**

The poultry industry is establishing a programme to monitor antibiotic resistant bacteria in all of its broiler sheds. Currently 90% of the industry is monitored.

The industry has a Research Programme to explore the feasibility of using alternatives to antibiotics which is entitled 'Necrotic Enteritis Microbial Management System'. This study is collaboration between Crop and Food that is a Crown Research Institute; the Monogastric Research Centre at Massey University; the University of Otago; Poultry Industry Association of New Zealand (Inc.), Kemin Industries Pte Limited and the Foundation for Science and Technology.

The aim of this project is to develop the various tools and associated management systems for the manipulation of gut micro flora in intensively reared broiler chickens to control necrotic enteritis with significantly reduced or possibly even no levels of antibiotics.